HANDBOOK 66550R

ORDER WIRE EQUIPMENT

comprising

TERMINAL ORDER WIRE 1R66550

PORTABLE ORDER WIRE 1R66551

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AMALGAMATED WIRELESS (AUSTRALASIA) LIMITED

Engineering Products Division

422 LANE COVE ROAD, NORTH RYDE, N.S.W. 2113

AUSTRALIA

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DRAWINGS

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COMPONENT LIST	Sheets 1 to 7
SCHEMATICS	
Terminal Station Unit	66550-1-09 Issue 1
Portable Unit	66551-1-05 Issue 1
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TERMINAL STATION ORDER WIRE UNIT

PORTABLE ORDER WIRE UNIT

ORDER WIRE EQUIPMENT

1R66550 - TERMINAL STATION

1R66551 - PORTABLE

1. INTRODUCTION

The order wire equipments 1R66550 and 1R66551 are designed to provide speech and selective signalling communication facilities for small and medium capacity cable carrier systems in which a phantom derived two-wire circuit is provided.

The equipment operates in parallel with the remote power feeding circuit over the phantom.

Communication may be established over loaded lines with a total attenuation in the band 300 to 3000 Hz of up to 80 dB and impedance of approximately 150 Ω.

The unit 1R66550 is for terminal station applications and may be mounted on racks of Type 72 equipment practice or of the CW97 type.

Unit 1R66551 is a portable battery powered unit for use at intermediate power-fed repeater sites.

In both units facilities are provided to signal at two out of a possible four frequencies and to respond to one out of four frequencies. Thus selective calling is available for terminal to terminal, terminal to portable and portable to terminal.

Speech communication is provided on a press-to-talk basis.

2. ELECTRICAL DATA

Line

Line Impedance	:	150 Ω (nominal) balanced
Line to Line Voltage	:	600 V DC maximum

Speech Performance

Speech Transmit Level	:	0 dBm (±3 dB)
Handset Microphone Level	:	2 mV nominal
Speech Receive Level	:	-83 dBm minimum
Handset Earpiece Level	:	-10 dBm nominal (600 Ω)
		0 dBm maximum (600 Ω)
Frequency Response (300 Hz - 2 kHz)	:	±3 dB relative to 800 Hz (in each direction)

2. ELECTRICAL DATA (CONT'D)

Signalling Performance

Signalling Frequencies (nominal)	:	750, 900, 1100 or 1200 Hz (by strapping options)
Signalling Frequency Tolerance	:	±1.5% (transmit) ±2 % (receive)
Signalling Level (transmit)	:	+10 dBm (±1 dB)
(receive)	:	-72 dBm minimum +10 dBm maximum

Noise Performance

No signalling response for speech-weighted noise input at a level of +10 dBmp maximum.

Earpiece Noise Level : -40 dBmp maximum

Environmental Performance

To A.P.O. Specification 1001, Issue 2, Category C.

Temperature Range : 0°C to +50°C

Power Supply Characteristics

(a) Terminal Station Unit

Input Voltage	:	-48 V DC (-47 V to -52.8 V), or -24 V DC (-23 V to -26.4 V)
Supply Current	:	Approx. 100 mA Maximum 150 mA

(b) Portable Unit

Battery Supply	:	18 V nominal (twelve 1.5 V size C alkaline cells, Eveready E93 or equivalent)
Current	:	Approx. 30 mA (idle)
	:	Approx. 70 mA with handset off cradle
	:	Approx. 110 mA maximum when signalling.

3. MECHANICAL DATA

(a) Terminal Station Unit

Dimensions	:	425 mm x 178 mm x 200 mm
Colour	:	Telecom Light Grey

(b) Portable Unit

Case Dimensions	:	250 mm x 200 mm x 130 mm excluding handle
Colour	:	Grey
Material	:	Impact moulded ABS plastic

4. CIRCUIT DESCRIPTION

4.1 General

Due to the great similarity in the electrical operation of the terminal and portable units the following description applies to both, except where specifically stated otherwise.

Both units use the identical printed circuit board. However, in the case of the portable, some components are not fitted.

Refer to the appropriate schematic drawing.

The circuits may be conveniently divided into seven sections each of which is described below.

4.2 Power Supply

4.2.1 Terminal Station Unit

For -24 V operation, power is applied directly to board terminals 3 and 4.

For -48 V operation, power is supplied to terminals 3 and 4 via R37 and zener diode D13 (refer to schematic note 3). The purpose of D13 is to limit the maximum voltage applied to the board to -27 V. D13 is NOT intended to perform the function of a regulator.

Components R36, C38 and MN6 provide a regulated -12 V supply for the internal circuitry. Integrated circuit MN6 is internally current and temperature limited. Power is continuously supplied to both the send and receive portions of the equipment.

4. CIRCUIT DESCRIPTION (CONT'D)

4.2.2. Portable Unit

Power is provided by twelve 1.5 V batteries which connect to board terminals 3 and 4 via POWER ON-OFF switch SE and lid switch SD.

MN6 provides a regulated -12 V supply.

Current will not be drawn from the batteries when the lid is closed (holding SD open) or when SE is switched off.

With the lid open and SE ON, power is supplied continuously to the receive portion of the unit but the transmit portion is not powered until the handset is lifted off the cradle switch thus bridging board terminals 8 and 9.

The batteries used in this unit should be 1.5 V alkaline cells (size C), e.g., Eveready type E93. However, in an emergency, standard carbon-zinc cells may be used but with reduced battery life.

4.3 Line Section

The two-wire, phantom derived line connects to board terminals 1 and 2. Capacitor C1 provides DC isolation between the two wires (between which remote power feed voltage exists).

Transformer T1 has two secondary windings, only one of which is terminated at any time.

The transmit/receive relay RLA is normally de-energised and the unit is in the receive mode. Incoming signals are applied via contacts RLA1 to a peak limiter D1, D2 and high-pass filter C2, C3, C4, L1 which attenuates frequencies below 300 Hz. Resistors R1 and RV1 provide the filter termination.

When RLA is operated for speech or signalling, the unit output to line is via RLA2.

4.4 Speech Receiver

The speech receiver comprises SPEECH GAIN control RV1 and a switched gain amplifier MN1b.

With switch SC set to LONG LINE the maximum amplifier gain is approximately 80 dB whereas when SC is set to SHORT LINE the gain is reduced to 40 dB.

Thus SC should be set to LONG LINE for line attenuations above 40 dB and to SHORT LINE for line attenuations below 40 dB. RV1 provides a continuous control of the earpiece level at either setting.

4. CIRCUIT DESCRIPTION (CONT'D)

4.5 Signalling Receiver

All signals (speech, signalling or noise) are picked off from the output of the high-pass filter and applied via R3 to diodes D3, D4 which limit very high signal levels to an acceptable magnitude.

Integrated circuit MN1a and associated components form a compression amplifier. Signals amplified by MN1a (by approx. 80 dB) are applied to a standard voltage doubler D6, D7 and filtered by C15, R6 and C14. A DC voltage proportional to peak signal amplitude thus is applied to TR1 which varies the impedance of diode D5.

This diode forms one leg of an L pad, the other leg being predominently R4.

When signal level rises, the impedance of D5 drops. This increases the pad loss and tends to compensate for the level increase thus maintaining a relatively constant level at the output of MN1a over a wide range of input signals.

Resistor R8 is factory preset to provide a level of about 50 mV r.m.s. at the junction of R9 and R10 for a line input level of -70 dBm.

The constant amplitude signal is then applied to the signalling detector MN3, a phase locked loop tone decoder consisting of a conventional phase locked loop together with a self contained quadrature loop. The purpose of the quadrature loop is to provide a positive indication that the main loop has achieved lock on an incoming signal within the main loop band width (capture range). The IC operates from a -5.6 V regulator R11, D8.

The loop centre (free running) frequency is set by C21 and RV2, R14, R15 or R16. This frequency can therefore be preset to any one of four nominal frequencies (750 Hz, 900 Hz, 1100 Hz, 1200 Hz). Note that the frequency can be measured at TP1 using a high impedance probe of 10 MΩ minimum resistance.

The loop capture range is set by C19.

If a signal is received within the loop capture range, and if it persists for sufficient time, the main loop will achieve lock, the quadrature loop will operate, and -5.6 V will appear at MN3 pin 8. Thus, on receipt of the required signalling tone, TR2 is switched on, relay RLB operates and the sonalert SP1 sounds. RLB extends alarm contacts to the station alarm system and also locks RLB and SP1 via contacts RLB1 if strap 46-47 is made. The alarm may be cancelled by operating the alarm reset switch SB provided the signalling tone has disappeared.

In the portable unit, RLB is not fitted and the sonalert will follow the incoming signalling tone bursts without lock-up.

Due to the time required for the loop to lock, noise will not cause the loop to respond even at high levels of noise.

4. CIRCUIT DESCRIPTION (CONT'D)

4.6 Speech Transmitter

The low-level output from the handset microphone is amplied by MN2, then by MN4, and goes out to line if RLA is operated by the push-to talk button.

4.7 Signalling Transmitter

The integrated circuit MN5 is a phase-locked tone decoder used purely as a free running square wave generator powered by a -5.6 V regulator R25, D10. The generator frequency is set by C29 and RV3 with R22, R23, R24 and can be measured at TP2 using a high impedance (10 MΩ min.) probe. With the call switch SA in its normal position the generator is off.

When SA is operated to either of the call positions, the generator will operate. The frequency is determined by the choice of strappings provided, i.e 40 to 41 or 42, and 43 to 44 or 45.

The square wave output at MN5 pin 8 is applied to a low-pass filter C32, C33, C34, L2 converting the square wave to a sinusoid which is then fed to MN4 via R30. This resistor sets the level of the signalling tone transmitted to line (nominally +10 dBm, 150 Ω).

A second set of contacts on SA operates the transmit/receive relay to send the tone to line (see Section 4.8).

4.8 Transmit/Receive Relay

The transmit/receive relay RLA may be operated by the handset push-to-talk button at board terminals 14 and 15 or by the CALL switch SA.

When SA is operated to either of the CALL positions, C35 charges slowly towards -12 V. This delays operation of RLA by about one second after SA is operated to enable the signalling generator frequency to stabilise. When TR3 base voltage reaches approximately -5.4 V, RLA will operate.

When SA is returned to normal, C35 discharges via R31 and R32.

5. INSTALLATION

5.1 Preliminary

Prior to installing the terminal station unit or using the portable unit carry out the following procedures on the bench.

5.1.1. Terminal Station Unit

(i) To open the panel, loosen the captive retaining screw. The panel will hinge open.

(ii) For operation from a -48 V supply, strap terminals 2 and 3 on terminal block TBB.

For -24 V operation, no strapping is required.

5. INSTALLATION (CONT'D)

5.1.1. Terminal Station Unit (cont'd)

(iii) Strap board terminal 31 to terminal 32, 33, 34 or 35 for the desired signalling response frequency.

(iv) Strap board terminals 46 and 47 if locking alarm is required.

(v) Strap board terminal 40 to 41 or 42 for desired CALL TERMINAL frequency, and 43 to 44 or 45 for desired CALL PORTABLE frequency.

(vi) Replace the front panel and tighten the captive screw.

5.1.2 Portable Unit

(i) Loosen the two knurled screws holding the case handle to the case and remove the handle and strap assembly.

(ii) Remove the case by lifting it off the front panel.

(iii) Make strap connections as for 5.1.1 (iii) and (v) above.

(iv) Refit case and handle assembly and tighten screws.

(v) Remove the battery compartment cover by undoing the two holding screws.

(vi) Fit the batteries (twelve 1.5 V Eveready E93 alkaline cells or equivalent), noting polarities. Refit the cover.

The unit is ready for operation.

5.2 Installation of Terminal Station Unit

Having carried out the operations of Section 5.1.1 above, install the unit as follows:

(i) Fit the panel to the rack.

(ii) Open the panel as in para. 5.1.1.(i). Connect the line pair to terminals TBA/1 and TBA/4, feeding the cable in through the left side cut-out for Type 72 racks or rear panel cut-out for CW97 racks.

NOTE: Ensure that the bearer system power feed circuit is inoperative (warning notice provided on rear panel).

(iii) Connect the station DC supply to terminals TBB/3 (-) and TBB/4 (+) for a -24 V supply, or TBB/1 (-) and TBB/4 (+) for a -48 V supply. Cable entry is from the right, using the side cut-out for Type 72 racks or the rear panel cut-out for CW97 racks.

5. INSTALLATION (CONT'D)

5.2 Installation of Terminal Station Unit (cont'd)

(iv) Connect station alarm pairs to terminals TBC/1 and 2, and TBC/3 and 4 via cable entry cut-outs as in (iii) above. For earth operation of rack and station alarms, make the following connections:

TBC/1	Station alarm lead
TBC/3	Rack alarm lead
TBC/2 & 4	Earth

(v) Position the front panel and tighten the retaining screw.

The unit is ready for operation.

6. OPERATION

6.1 Line Connection

In the terminal station unit this connection is permanent. In the portable unit, connect the cord provided from the unit LINE jack to the bearer system repeater sockets (VOICE COMM).

6.2 Calling (refer also to 4.4)

6.2.1 From the Terminal Station Unit

To signal the remote site, operate the CALL TERMINAL/CALL PORTABLE switch to the desired position. Hold in that position for at least one second before releasing.

This will cause the remote site receiver to sound its audible alarm.

6.2.2. From the Portable Unit

To signal the remote terminal, open the lid and operate the POWER switch to ON. Lift the handset off the cradle and operate the CALL switch to select terminal A or B as desired. Hold in that position for at least one second before releasing.

6.3 Speaking (refer also to 4.4)

In both units, speech communication is on a push-to-talk basis, i.e., depress the handset push-button to speak, release to listen.

In the terminal station unit this is possible at any time.

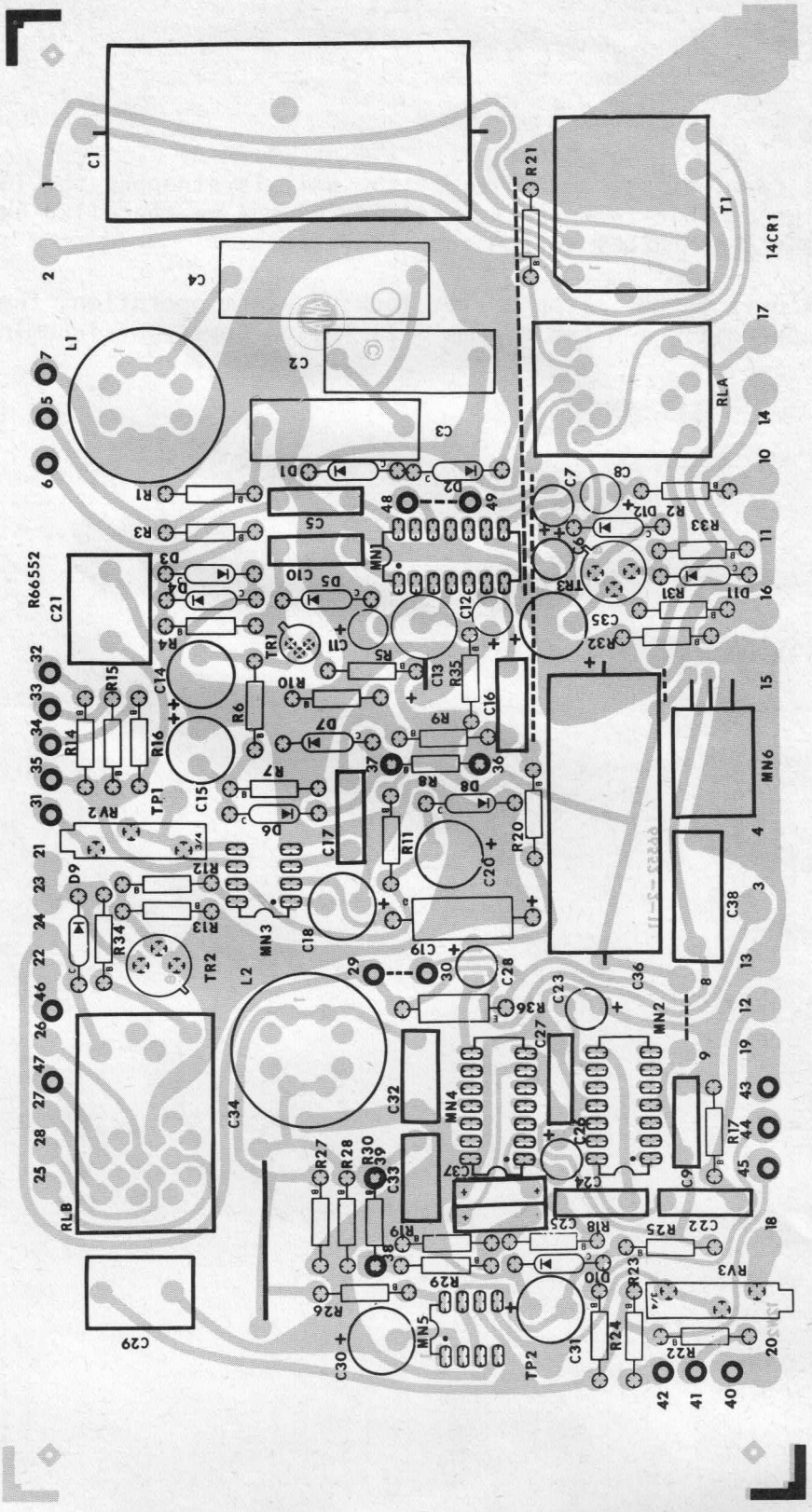
In the portable unit, the lid must be open, the POWER switch in the ON position, and the handset off the cradle switch.

6. OPERATION (CONT'D)

6.4 Alarms

In the terminal station unit, if the unit is strapped for lock-up alarm operation, the audible tone and station alarms may be cancelled by momentarily depressing the ALARM RESET switch and releasing.

If the unit is not strapped for lock-up alarm operation, the ALARM RESET switch is inoperative and the alarms will follow bursts of incoming signalling tone.



NOTE: COMPONENTS R34, R36 AND RLB ARE USED IN TERMINAL STATION UNIT 1R66550 ONLY.

AMALGAMATED WIRELESS (AUSTRALASIA) LTD ENGINEERING PRODUCTS DIVISION	TITLE ORDER WIRE UNITS 1R66550, 1R66551 P.C.B. LAYOUT	
TYPE No. 1R66552 2R66552	DRAWING No. 66552-4-50	ISSUE 0

Circuit Reference	Description	Value	Tolerance & Rating	AWA Code No.	Manufacturer Code	Manufacturer Type No.
RESISTORS						
R1	Resistor, Metal Glaze	1.5 K	2% 250 mW	1008750	5	RG1/4
R2	" " "	560	" "	1008740	"	"
R3	" " "	4.7 K	" "	1008762	"	"
R4	" " "	100 K	" "	1008794	"	"
R5	" " "	1 K	" "	1008746	"	"
R6	" " "	6.8 K	" "	1008766	"	"
R7	" " "	15 K	" "	1008774	"	"
R8	" " "	S.O.T.	" "	-	"	"
R9	" " "	8.2 K	" "	1008768	"	"
R10	" " "	430	" "	1008737	"	"
R11	" " "	300	" "	1008733	"	"
R12	" " "	3.3 K	" "	1008758	"	"
R13	" " "	1 K	" "	1008746	"	"
R14	" " "	5.36 K	1% "	1014262	"	RN1/4
R15	" " "	3.01 K	" "	1014238	"	"
R16	" " "	825	" "	1014184	"	"
R17	" " "	220	2% "	1008730	"	RG1/4
R18	" " "	30 K	" "	1008781	"	"
R19	" " "	2.2 K	" "	1008754	"	"
R20	" " "	75	" "	1008719	"	"
R21	" " "	75	" "	1008719	"	"

Circuit Reference	Description	Value	Tolerance & Rating		AWA Code No.	Manufacturer	
						Code	Type No.
RESISTORS							
R22	Resistor, Metal Glaze	5.36 K	1%	250 mW	1014242	5	RN1/4
R23	" " "	3.01 K	"	"	1014238	"	"
R24	" " "	825	"	"	1014184	"	"
R25	" " "	300	2%	"	1008733	"	RG1/4
R26	" " "	10 K	"	"	1008770	"	"
R27	" " "	1.2 K	"	"	1008748	"	"
R28	" " "	1.5 K	"	"	1008750	"	"
R29	" " "	3.3 K	"	"	1008758	"	"
R30	" " "	S.O.T.	"	"	-	"	"
R31	" " "	12 K	"	"	1008772	"	"
R32	" " "	2.7 K	"	"	1008756	"	"
R33	" " "	150	"	"	1008726	"	"
* R34	" " "	220	"	"	1008730	"	"
R35	" " "	22	"	"	1008706	"	"
* R36	" " "	56	5%	1W	-	"	GL1
* R37	" Wire Wound	180	"	5W	-	"	PW5
R38	" Carbon Film	470	"	125mW	606615	15	2322.101.334

Circuit Reference	*Description*	*Value*	*Tolerance & Rating*		*AWA Code No.*	*Manufacturer*	
						Code	*Type No.*
RESISTORS							
RV1	Potentiometer, Carbon	10K 1og	20%	1W	-	16	70A1G032P103R
RV2	Resistor, Variable Cermet	20K	10%	750mW	-	17	43P203
RV3	" " "	20K	"	"	-	17	"
* Used in Terminal Order Wire Unit 1R66550 only							
CAPACITORS							
C1	Capacitor, Polyester	4.7 µF	10%	600 V	-	18	TME475KM600A
C2	" "	600 nF	"	250 V	-	3	PHE240H660
C3	" "	"	"	"	-	3	PHE240H660
C4	" Polycarbonate	4.7 µF	"	100 V	-	15	2222.344.2147
C5	" Polyester	100 nF	20%	"	1019789	3	PHE241D610
C6	" Tantalum	4.7 µF	+50,-20%	35 V	228194	19	TAG
C7	" "	"	"	"	"	19	TAG
C8	" "	1 µF	"	"	227850	19	TAG
C9	" Polyester	100 nF	20%	100 V	1019789	3	PHE241D610
C10	" "	"	"	"	"	3	PHE241D610
C11	" Tantalum	1 µF	+50,-20%	35 V	228194	19	TAG
C12	" "	2.2 µF	"	"	227936	19	TAG

Circuit Reference	Description	Value	Tolerance & Rating		AWA Code No.	Manufacturer Code	Manufacturer Type No.
CAPACITORS							
C13	Capacitor, Tantalum	150 µF	10%	15 V	229736	20	CS13
C14	" "	10 µF	+50, -20%	25 V	228788	19	TAG
C15	" "	"	"	"	"	19	TAG
C16	" Polyester	100 nF	20%	100 V	1019789	3	PHE241D610
C17	" "	"	"	"	"	3	"
C18	" Tantalum	10 µF	+50, -20%	25 V	228788	19	TAG
C19	" "	1.5 µF	±10%	35 V	-	21	CS13
C20	" "	10 µF	+50, -20%	25 V	228788	19	TAG
C21	" Polycarbonate	100 nF	1%	63 V	-	22	R100NF63
C22	" Polyester	"	20%	100 V	1019789	3	PHE241D610
C23	" Tantalum	4.7 µF	+50, -20%	35 V	228194	19	TAG
C24	" Polyester	100 nF	20%	100 V	1019789	3	PHE241D610
C25	" "	"	20%	"	"	3	"
C26	" Tantalum	2.2 µF	+50, -20%	35 V	227936	19	TAG
C27	" Polyester	100 nF	20%	100 V	1019789	3	PHE241D610
C28	" Tantalum	4.7 µF	+50, -20%	35 V	228194	19	TAG
C29	" Polycarbonate	100 nF	1%	63 V	-	22	R100NF63
C30	" Tantalum	10 µF	+50, -20%	35 V	228788	19	TAG
C31	" "	10 µF	+50, -20%	35 V	"	19	TAG
C32	" Polyester	220 nF	20%	100 V	1000434	3	PHE241D622
C33	" "	"	"	"	"	3	PHE241D622

Circuit Reference	Description	Value	Tolerance & Rating		AWA Code No.	Manufacturer Code	Manufacturer Type No.
	CAPACITORS						
C34	Capacitor, Polystyrene	36500pF	2%	200 V	-	3	PFE216GD5365G
C35	" Tantalum	100µF	+50, -20%	6 V	1004128	19	TAG
C36	" Alum. Electro	1000µF	+50, -10%	16 V	-	3	PEG124GG410
C37	" Polyester	100nF	20%	100 V	1019789	3	PHE241D610
C38	" "	470nF	10%	"	1019251	3	PHE241D647
	SEMI-CONDUCTORS						
D1	Diode Zener Silicon	4.7 V	5%	400 mW	596857	15	BZX79C4V7
D2	" " "	"	"	"	"	"	"
D3	" Germanium	-	-	-	597212	"	OA47
D4	" "	-	-	-	"	"	"
D5	" Silicon	-	-	-	797291	7	IN914
D6	" Germanium	-	-	-	597212	15	OA47
D7	" "	-	-	-	"	"	"
D8	" Zener Silicon	5.6 V	5%	400 mW	1006326	"	BZX79C5V6
D9	" "	-	-	-	1004812	19	EM404
D10	" Zener "	5.6 V	5%	400 mW	1006326	15	BZX79C5V6
D11	" "	-	-	-	1004812	19	EM404
D12	" Zener "	4.7 V	5%	400 mW	596857	15	BZX79C4V7
* D13	" " "	27 V	"	20 W	-	"	BZY93C27

* Used in Terminal Order Wire Unit 1R66550 only.

Circuit Reference	Description	Value	Tolerance & Rating	AWA Code No.	Manufacturer Code	Manufacturer Type No.
TR1	Transistor, Silicon PNP	-	- -	906790	7	2N4250
TR2	" " "	-	- -	1017611	"	2N2905A
TR3	" " "	-	- -	"	"	"
MN1	Integrated Circuit	-	- -	-	8	LM382N
MN2	" "	-	- -	-	"	"
MN3	" "	-	- -	-	"	LM567CN
MN4	" "	-	- -	-	"	LM380N
MN5	" "	-	- -	-	"	LM567CN
MN6	" "	-	- -	-	7	MC7912CP
	INDUCTORS/TRANSFORMERS					
L1	Inductor	677 mH	- -	-	1	392V57997
L2	"	112 mH	- -	-	"	391V57997
T1	Transformer				"	1LP69950

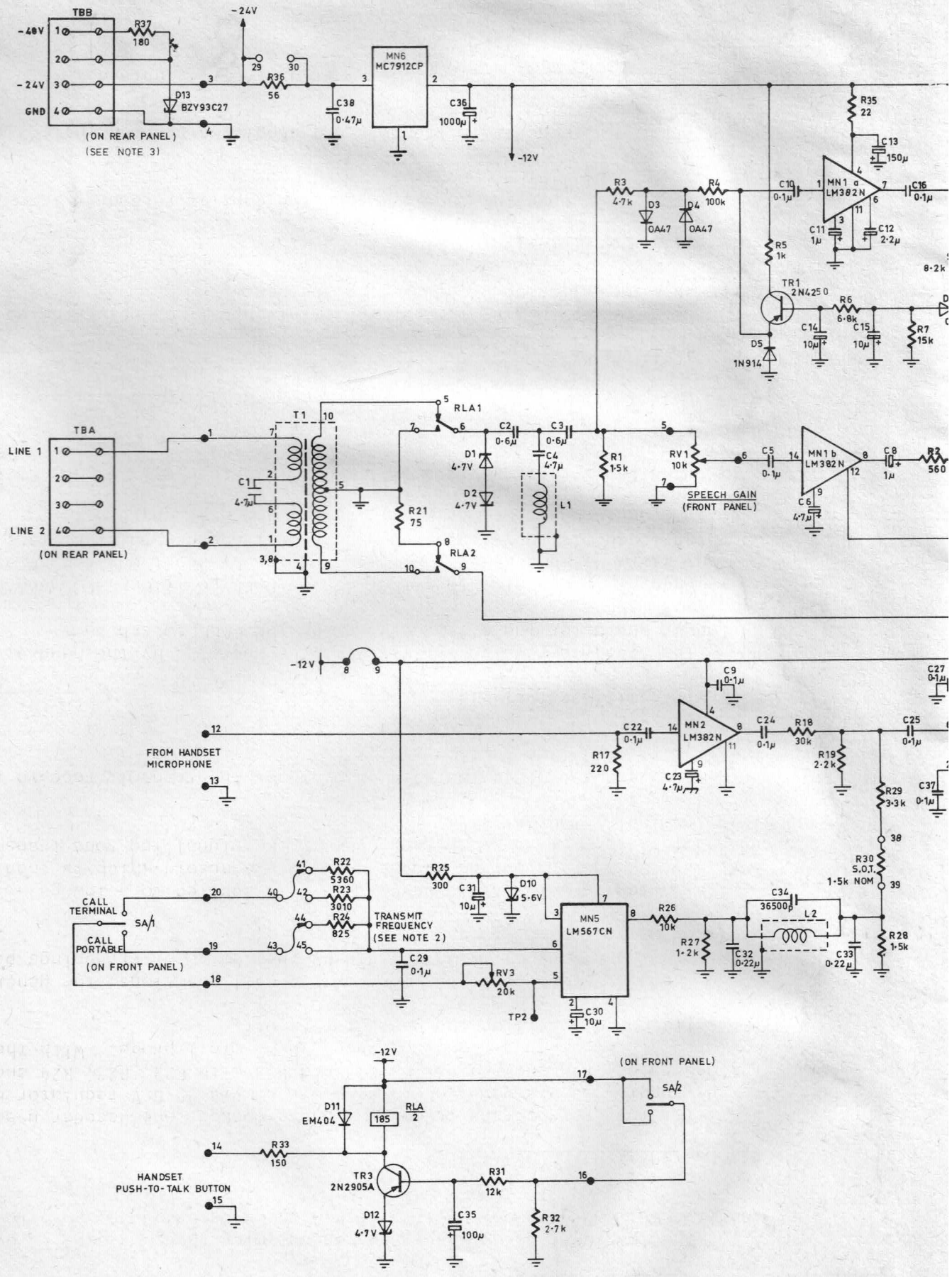
Circuit Reference	Description	Value	Tolerance & Rating	AWA Code No.	Manufacturer Code	Manufacturer Type No.
	MISCELLANEOUS					
SA	Switch, Toggle	-	- -	-	23	7205
* SB	" "	-	- -	-	"	7109
SC	" "	-	- -	858320	"	7201
+ SD	" , Push Button	-	- -	1016941	25	30(NC)P61-03
+ SE	" , Toggle	-	- -	858320	23	7201
+	" , Cradle	-	- -	-	1	1R67682
RLA	Relay	-	- -	-	24	21-2CA-185
* RLB	"	-	- -	-	"	21-4CS-700
SP1	Sonalert	-	- -	-	21	SC628P
	Handset	-	- -	-	1	77001/002

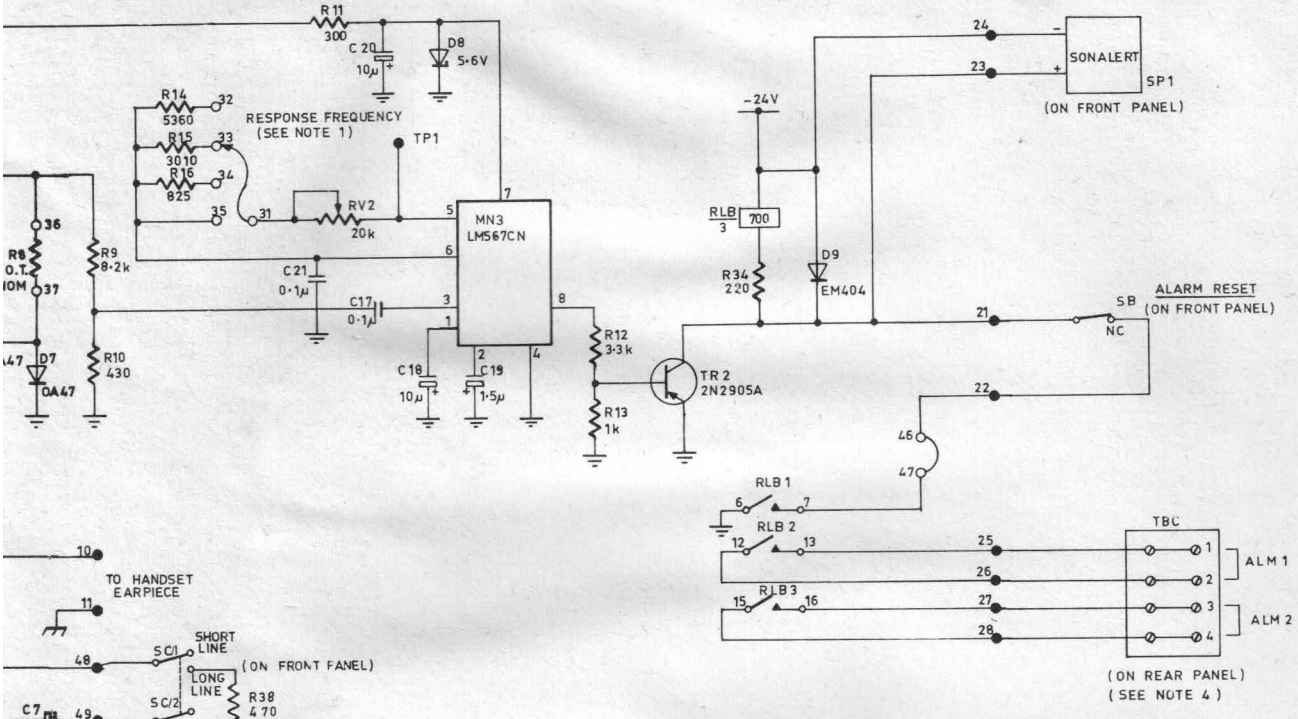
* Used in Terminal Order Wire 1R66550 only

\+ Used in Portable Order Wire 1R66551 only.

MANUFACTURERS CODE LISTING

CODE NUMBER	MANUFACTURER
1	Amalgamated Wireless (Australasia) Limited.
2	Sprague Electric Company.
3	Rifa, Australia.
4	Elmenco Corporation.
5	International Resistance Holdings (IRH).
6	Morganite Australia.
7	Motorola or Fairchild or Texas or Elcoma or RCA
8	National Semiconductors.
9	T.D.K. Electronics Co. Ltd.
10	Siemens A.G.
11	ITT-Cannon.
12	Electrosil.
13	Mallory & Co. Inc.
14	A.B. Controls Ltd.
15	Philips Elcoma Division.
16	Allen Bradley Co.
17	Spectrol Electronics Corporation.
18	Shizuki Manufacturing Co.
19	Standard Telephones & Cables Ltd.
20	Union Carbide Corporation.
21	Plessey Components Division.
22	MFD Capacitors Ltd.
23	C. & K. Electronics (Aust.) Pty. Ltd.
24	Davall & Sons Ltd.
25	Grayhill Incorporated.


TBB
-40V
-24V
GND
(ON REAR PANEL)
(SEE NOTE 3)
R37 180
D13 BZY93C27
-24V
R36 56
C38 0·47µ
MN6 MC7912CP
C36 1000µ
-12V
R35 22
C13 150µ
R3 4·7k
R4 100k
D3 OA47
D4 OA47
C10 0·1µ
MN1 a LM382N
C16 0·1µ
C11 1µ
C12 2·2µ
R5 1k
TR1 2N4250
R6 6·8k
C14 10µ
C15 10µ
R7 15k
D5 1N914
TBA
LINE 1
LINE 2
(ON REAR PANEL)
T1
C1 4·7µ
RLA1
RLA2
C2 0·6µ
C3 0·6µ
D1 4·7V
D2 4·7V
C4 4·7µ
L1
R21 75
R1 1·5k
RV1 10k
SPEECH GAIN
(FRONT PANEL)
C5 0·1µ
MN1 b LM382N
C8 1µ
C6 4·7µ
-12V
FROM HANDSET MICROPHONE
C9 0·1µ
C22 0·1µ
MN2 LM382N
C24 0·1µ
R18 30k
C25 0·1µ
R17 220
C23 4·7µ
R19 2·2k
C27 0·1µ
C37 0·1µ
R29 3·3k
R30 S.O.T. 1·5k NOM
CALL TERMINAL
CALL PORTABLE
SA/1
(ON FRONT PANEL)
R22 5360
R23 3010
R24 825
TRANSMIT FREQUENCY (SEE NOTE 2)
R25 300
C31 10µ
D10 5·6V
MN5 LM567CN
R26 10k
C34 36500p
L2
R27 1·2k
C32 0·22µ
C33 0·22µ
R28 1·5k
C29 0·1µ
RV3 20k
TP2
C30 10µ
-12V
(ON FRONT PANEL)
SA/2
D11 EM404
RLA 2
185
R33 150
HANDSET PUSH-TO-TALK BUTTON
TR3 2N2905A
R31 12k
D12 4·7V
C35 100µ
R32 2·7k



NOTES

1. RESPONSE FREQUENCIES

750Hz	BRIDGE	PIN	31 – 32
900Hz	"	"	31 – 33
1100Hz	"	"	31 – 34
1200Hz	"	"	31 – 35

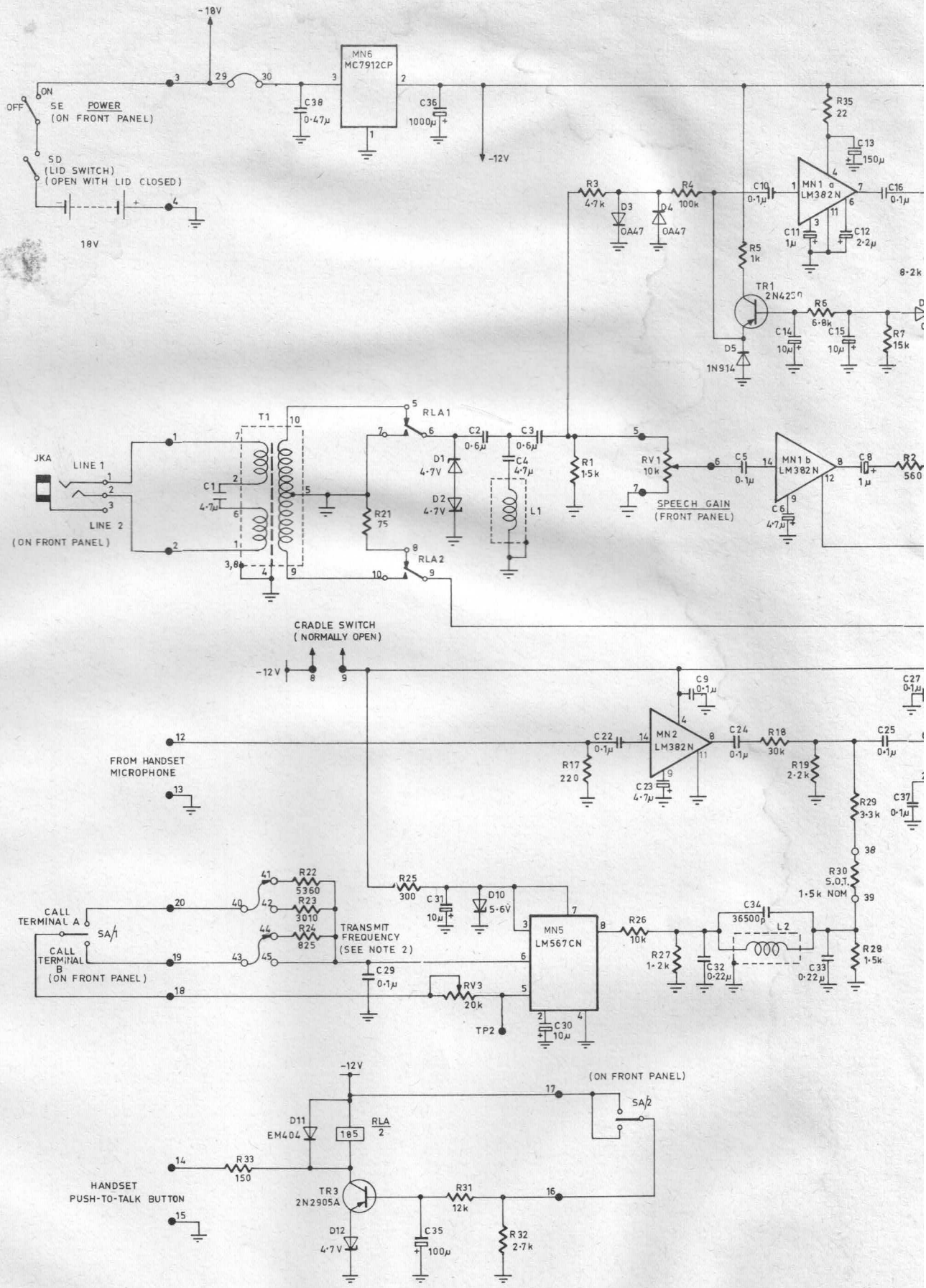
2. TRANSMIT FREQUENCIES

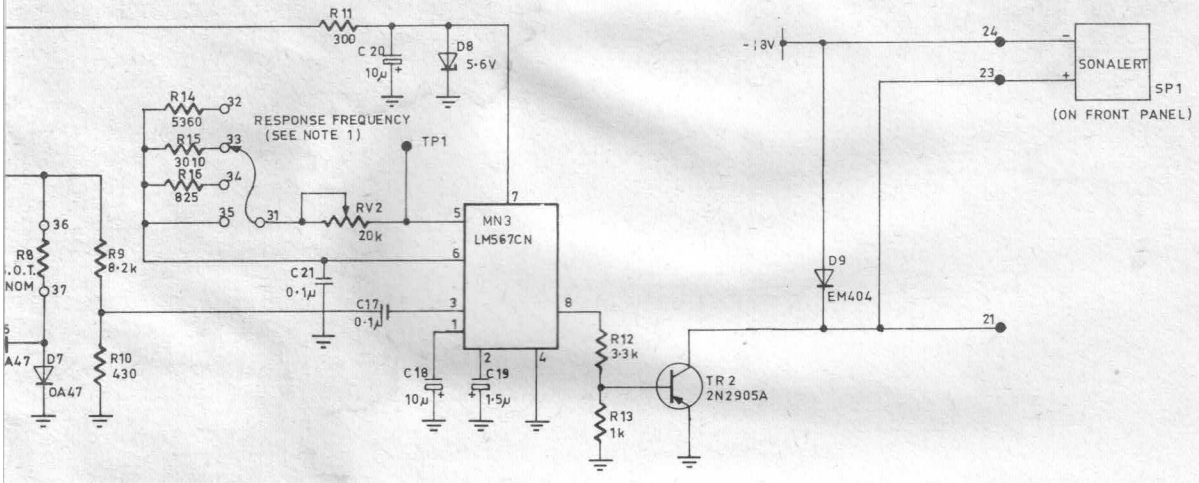
750Hz	BRIDGE	PIN	40 – 41
900Hz	"	"	40 – 42
1100Hz	"	"	43 – 44
1200Hz	"	"	43 – 45

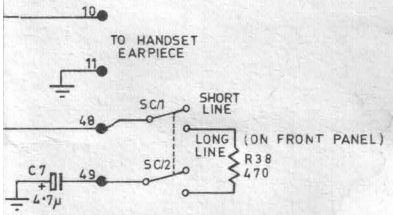
3. FOR -48V OPPERATION:
   CONNECT -48V TO TBB/1
   STRAP TBB/2 TO TBB/3
   FOR -24V OPPERATION:
   CONNECT -24V TO TBB/3
   SUPPLY GROUND TO TBB/4

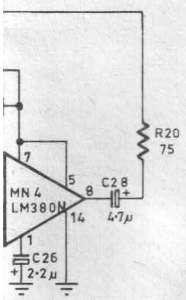
4. FOR EARTH OPPERATION OF RACK & STATION ALARMS, MAKE THE FOLLOWING CONNECTIONS:
   TBC/1 — STATION ALARM LEAD
   TBC/3 — RACK ALARM LEAD
   TBC/2,4 — EARTH

AMALGAMATED WIRELESS (AUSTRALASIA) LTD ENGINEERING PRODUCTS DIVISION	TITLE: ORDER WIRE (TERMINAL UNIT)		
TYPE No. 1R 66550	DRAWING No. 66550 – 1 – 09	ISSUE 1	


-18V
MN6
MC7912CP
C38
0·47µ
C36
1000µ
-12V
ON
OFF
SE POWER
(ON FRONT PANEL)
SD
(LID SWITCH)
(OPEN WITH LID CLOSED)
18V
R35
22
C13
150µ
MN1 a
LM382N
C10
0·1µ
C16
0·1µ
R3
4·7k
R4
100k
D3
OA47
D4
OA47
C11
1µ
C12
2·2µ
R5
1k
TR1
2N4250
R6
6·8k
C14
10µ
C15
10µ
R7
15k
D5
1N914
T1
JKA
LINE 1
LINE 2
(ON FRONT PANEL)
C1
4·7µ
RLA1
RLA2
D1
4·7V
D2
4·7V
C2
0·6µ
C3
0·6µ
C4
4·7µ
L1
R1
1·5k
R21
75
RV1
10k
SPEECH GAIN
(FRONT PANEL)
C5
0·1µ
MN1 b
LM382N
C6
4·7µ
C8
1µ
CRADLE SWITCH
(NORMALLY OPEN)
FROM HANDSET
MICROPHONE
C9
0·1µ
MN2
LM382N
C22
0·1µ
R17
220
C23
4·7µ
C24
0·1µ
R18
30k
R19
2·2k
C25
0·1µ
C27
0·1µ
C37
0·1µ
R29
3·3k
R30
5·0k
1·5k NOM
R22
5360
R23
3010
R24
825
R25
300
C31
10µ
D10
5·6V
CALL
TERMINAL A
SA/1
CALL
TERMINAL
B
(ON FRONT PANEL)
TRANSMIT
FREQUENCY
(SEE NOTE 2)
C29
0·1µ
RV3
20k
TP2
MN5
LM567CN
C30
10µ
R26
10k
R27
1·2k
C32
0·22µ
C34
36500p
L2
C33
0·22µ
R28
1·5k
-12V
(ON FRONT PANEL)
SA/2
D11
EM404
RLA
185
2
HANDSET
PUSH-TO-TALK BUTTON
R33
150
TR3
2N2905A
R31
12k
D12
4·7V
C35
100µ
R32
2·7k







NOTES

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2. TRANSMIT FREQUENCIES

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900Hz	"	"	40 – 42
1100Hz	"	"	43 – 44
1200Hz	"	"	43 – 45

AMALGAMATED WIRELESS (AUSTRALASIA) LTD ENGINEERING PRODUCTS DIVISION	TITLE ORDER WIRE (PORTABLE UNIT)	
TYPE No. 1R 66551	DRAWING No. 66551 – 1 – 05	ISSUE 1